

CLEAN VERSION OF AMENDED CLAIMS

24. (five times amended) A semiconductor package comprising:

a substrate comprising a first surface, a second surface, a plurality of conductors and ball bonding pads on the first surface, and a bonding opening from the first surface to the second surface;

a semiconductor die having a first outline and a face on the bonding opening bonded directly to the second surface;

a first mask on the first surface comprising a plurality of via openings aligned with the ball bonding pads;

a second mask covering the second surface except in a die attach area defined by an opening through the second mask having a second outline corresponding to but only slightly larger than the first outline;

an adhesive layer between the face and the substrate in the die attach area bonding the die to the second surface;

a plurality of wires placed through the bonding opening and wire bonded to the die and to the conductors; and

an encapsulating resin on the die and on the second mask.

27. (five times amended) A semiconductor package comprising:

a substrate comprising a first surface, a second surface, a plurality of conductors on the first surface comprising ball bonding pads and wire bonding pads, and a bonding opening from the first surface to the second surface;

a semiconductor die having a first outline, the die comprising a face on the bonding opening bonded to the second surface;

a first mask on the first surface comprising a plurality of via openings aligned with the ball bonding pads and a first opening exposing the wire bonding pads;

a second mask substantially covering the second surface comprising a second opening having a second outline corresponding to but only slightly larger than the first outline to define an open die attach area on the second surface;

a filled adhesive layer between the face and the substrate in the open die attach area bonding the die to the second surface and transferring heat directly from the face to the substrate;

a plurality of wires in the bonding opening wire bonded to the die and to the wire bonding pads; and

an encapsulating resin on the die and on the second mask.

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CLEAN VERSION OF ALL PENDING CLAIMS

24. (five times amended) A semiconductor package comprising:

Sub G
a substrate comprising a first surface, a second surface, a plurality of conductors and ball bonding pads on the first surface, and a bonding opening from the first surface to the second surface;

F
a semiconductor die having a first outline and a face on the bonding opening bonded directly to the second surface;

F
a first mask on the first surface comprising a plurality of via openings aligned with the ball bonding pads;

a second mask covering the second surface except in a die attach area defined by an opening through the second mask having a second outline corresponding to but only slightly larger than the first outline;

an adhesive layer between the face and the substrate in the die attach area bonding the die to the second surface;

a plurality of wires placed through the bonding opening and wire bonded to the die and to the conductors; and

an encapsulating resin on the die and on the second mask.

Sub A1
25. (four times amended) The package of claim 24 wherein the encapsulating resin comprises epoxy.

Sub A1
26. (four times amended) The package of claim 25 wherein the adhesive layer comprises a filled adhesive configured to transfer heat directly from the face to the second surface.

27. (five times amended) A semiconductor package comprising:

Sub G2 → a substrate comprising a first surface, a second surface, a plurality of conductors on the first surface comprising ball bonding pads and wire bonding pads, and a bonding opening from the first surface to the second surface;

Cont'd ↓ *F1* a semiconductor die having a first outline, the die comprising a face on the bonding opening bonded to the second surface;

a first mask on the first surface comprising a plurality of via openings aligned with the ball bonding pads and a first opening exposing the wire bonding pads;

a second mask substantially covering the second surface comprising a second opening having a second outline corresponding to but only slightly larger than the first outline to define an open die attach area on the second surface;

a filled adhesive layer between the face and the substrate in the open die attach area bonding the die to the second surface and transferring heat directly from the face to the substrate

a plurality of wires in the bonding opening wire bonded to the die and to the wire bonding pads; and

an encapsulating resin on the die and on the second mask.

Sub H1 ↘ 28. (thrice amended) The package of claim 27 further comprising a glob top in the bonding opening and on the first surface at least partially encapsulating the wires.

29. (thrice amended) The package of claim 27 wherein the first mask and the second mask comprise a photoimageable material.

Sub G3
30. (five times amended) A semiconductor package comprising:

a substrate having a first surface, a second surface and a bonding opening there through;

a plurality of conductors on the first surface;

a first mask on the first surface at least partially covering the conductors;

a second mask covering the second surface except in a die attach area defined by an opening through the second mask;

a semiconductor die on the die attach area having a face aligned with the bonding opening and attached to the second surface;

F1
a filled adhesive layer attaching the die to the substrate in the open die attach area configured to transfer heat directly from the face to the second surface;

a plurality of wires placed through the bonding opening and bonded to the die and to the conductors; and

an encapsulating resin on the second mask encapsulating the die.

Sub H1
31. (four times amended) The package of claim 30 wherein the encapsulating resin comprises epoxy.

32. (four times amended) The package of claim 30 further comprising a polymer in the bonding opening and on the first surface at least partially encapsulating the wires.

33. (four times amended) The package of claim 30 wherein the adhesive layer comprises a filled epoxy.

Sub G4
34. (four times amended) A semiconductor package comprising:

a substrate comprising a first surface, an opposing second surface and a wire bonding opening from the first surface to the second surface;

a plurality of conductors on the first surface comprising wire bonding pads and ball bonding pads;

a first mask on the first surface comprising a plurality of via openings aligned with the ball bonding pads and a first opening exposing the wire bonding pads;

a semiconductor die aligned with the wire bonding opening and bonded face down to the second surface, the die having a first outline;

a second mask substantially covering the second surface and including an opening there through having a second outline corresponding to but only slightly larger than the first outline to define an open die attach area on the second surface;

an adhesive layer between the die and the substrate in the open die attach area bonding the die directly to the second surface;

a plurality of wires placed through the wire bonding opening and bonded to the die and to the wire bonding pads; and

an encapsulating resin on the second mask encapsulating the die.

35. (thrice amended) The package of claim 34 further comprising a glob top in the wire bonding opening at least partially encapsulating the wires.

36. (four times amended) The package of claim 34 wherein the adhesive layer comprises a filled epoxy configured to transfer heat directly from the face to the substrate.